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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,562	07/01/2003	G. Dickey Arndt	MSC-23193-3	4523
24957	7590	06/02/2004	EXAMINER	
NASA JOHNSON SPACE CENTER MAIL CODE HA 2101 NASA RD 1 HOUSTON, TX 77058			MULL, FRED H	
			ART UNIT	PAPER NUMBER
			3662	

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/612,562

Applicant(s)

ARNDT ET AL.

Examiner

Fred H. Mull

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 56-96 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 56-96 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION***Double Patenting***

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

1. Claims 56-96 provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 56-96 of copending Application No. 10/612,561. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.
2. Application claims 60, 68, 84, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over patent claims 1, 11, 44, and 51, respectively of U.S. Patent No. 6,618,010 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because applicant admits the claims are functionally equivalent. Specifically with regard to claim 60, in applicant's Remarks, p. 22, section II. Amendments to the Claims, line 2, applicant states "Claim 56 is functionally equivalent to cancelled Claim 1." Cancelled

application claim 1 is identical to patent claim 1 except that patent claim 1 contains two formulas. Claim 60 adds the formulas to claim 56, so that the only difference between application claim 60 and patent claim 1 is the added limitation that applicant admits leaves the claims "functionally equivalent".

Specification

3. The disclosure is objected to because of the following informalities: In the amendment dated July 1, 2003, p. 2, line 4, "September" should be changed to -- November--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 56, 58-59, 63-64, and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by Uematsu.

In regard to claims 56 and 67, Uematsu discloses a passive system (col. 2, lines 39-50, where the system determines location information based on reception only, and does not need to transmit a signal in order to be able to determine the location information) for locating a transmitter, said transmitter producing a signal of a known

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frequency (col. 7, lines 21-22) and known modulation scheme (col. 1, lines 11-14; col. 10, lines 24-25, where a communication system works because each part of the system is aware of the modulation of the signals so they can receive the signals and demodulate the information from the signals), said system comprising: at least one antenna array having a first antenna element, a second antenna element and a third antenna element, said first antenna element (col. 1, line 51) being operable for receiving a first received signal from said transmitter, said second antenna element being operable for receiving a second received signal from said transmitter, and said third antenna being operable for receiving a third signal from said transmitter; electronic circuitry for said antenna array to determine a first phase difference and a second phase difference between said first received signal, said second received signal, and said third received signal, (col. 1, lines 59-64) said electronic circuitry being operable for utilizing said first phase difference and said second phase difference for determining location information related to a vector oriented in a direction of said transmitter with respect to said at least one antenna array (col. 1, lines 44-64).

In regard to claim 58, Uematsu further discloses a geometrical configuration of said first antenna element, said second antenna element, and said third antenna element such that a first leg between said first antenna element and said second antenna element and a second leg between said first antenna element and said third antenna element have a first angle therebetween less than one hundred eighty degrees (col. 1, lines 55-58).

In regard to claim 59, Uematsu further discloses said first angle is ninety degrees (col. 1, line 57, "perpendicular").

In regard to claim 63, Uematsu further discloses said electronic circuitry further comprises a local oscillator, said local oscillator being frequency locked with respect to said transmitter frequency but not being phase locked with respect to said transmitter frequency (col. 6, lines 26-37).

In regard to claim 64, Uematsu further discloses said electronic circuitry is operable for determining said first phase difference between said first received signal and said second received signal, and said electronic circuitry is operable for determining said second phase difference between said first received signal and said third received signal (col. 1, lines 60-64).

5. Claims 56 and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by Kochiyama.

Kochiyama discloses a passive system (col. 3, line 39 to col. 4, line 13, where the system determines location information based on reception only, and does not need to transmit a signal in order to be able to determine the location information) for locating a transmitter, said transmitter producing a signal of a known frequency (col. 4, lines 63-65) and known modulation scheme (col. 1, lines 6-38, where, since the whole purpose of the pilot signal is to be received by the receiver to indicate the direction the signal is coming from, it is inherent that the receiver would be aware of and looking for its properties, including frequency and modulation), said system comprising: at least one

antenna array having a first antenna element, a second antenna element and a third antenna element, said first antenna element (col. 4, lines 60-63) being operable for receiving a first received signal from said transmitter, said second antenna element being operable for receiving a second received signal from said transmitter, and said third antenna being operable for receiving a third signal from said transmitter; electronic circuitry for said antenna array to determine a first phase difference and a second phase difference between said first received signal, said second received signal, and said third received signal, (col. 5, lines 12-15) said electronic circuitry being operable for utilizing said first phase difference and said second phase difference for determining location information related to a vector oriented in a direction of said transmitter with respect to said at least one antenna array (col. col. 5, lines 12-29).

6. Claims 56-59, 63, 65, 67, 69, and 71-75 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokev.

In regard to claims 56 and 67, Yokev discloses a passive system (col. 2, line 43 to col. 3, line 5, where the system determines location information based on reception only, and does not need to transmit a signal in order to be able to determine the location information) for locating a transmitter, said transmitter producing a signal of a known frequency and known modulation scheme (col. 7, line 61 to col. 8, line 9), said system comprising: at least one antenna array having a first antenna element, a second antenna element and a third antenna element, said first antenna element (Figs. 4 and 5) being operable for receiving a first received signal from said transmitter, said second

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antenna element being operable for receiving a second received signal from said transmitter, and said third antenna being operable for receiving a third signal from said transmitter; electronic circuitry for said antenna array to determine a first phase difference and a second phase difference between said first received signal, said second received signal, and said third received signal, (col. 2, lines 53-54; col. 14, lines 11-13) said electronic circuitry being operable for utilizing said first phase difference and said second phase difference for determining location information related to a vector oriented in a direction of said transmitter with respect to said at least one antenna array (col. 1, line 52 to col. 3, line 6).

In regard to claim 57, Yokey further discloses said second antenna element is spaced apart from said first antenna element by one-half wavelength or an integer multiple thereof and said third antenna element being spaced apart from said first antenna element by one-half wavelength of integer multiple thereof (col. 16, lines 44-46).

In regard to claims 58-59, Yokey further discloses a geometrical configuration of said first antenna element, said second antenna element, and said third antenna element such that a first leg between said first antenna element and said second antenna element and a second leg between said first antenna element and said third antenna element have a first angle therebetween less than one hundred eighty degrees (Fig. 4, where the first antenna is taken to be the one between 30 degrees and 45 degrees, the second antenna is taken to be the one between 330 degrees and 315

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degrees, and the third antenna is taken to be the one between 135 degrees and 150 degrees).

In regard to claim 64, Yokey further discloses said electronic circuitry is operable for determining said first phase difference between said first received signal and said second received signal, and said electronic circuitry is operable for determining said second phase difference between said first received signal and said third received signal (col. 2, lines 53-54; col. 14, lines 11-13).

In regard to claims 63 and 72, Yokey further discloses said electronic circuitry further comprises a local oscillator, said local oscillator being frequency locked with respect to said transmitter frequency but not being phase locked with respect to said transmitter frequency (col. 11, lines 23-59).

In regard to claims 65 and 73, Yokey further discloses a spread spectrum receiver with a first receiver channel for processing said first received signal from said first antennae element, a second receiver channel for processing said second received signal from said second antenna element, and a third receiver channel for processing said third received signal from said third antenna element (col. 2, lines 48-52).

In regard to claim 74, Yokey further discloses downconverting and despreading said first received signal, said second received signal and said third received signal in said spread spectrum receiver (col. 13, lines 15-26).

In regard to claim 75, Yokey further discloses tracking multiple transmitter paths of said first received signal, said second received signal, and said third received signal (col. 2, lines 44-45).

In regard to claim 83, Yokey further discloses a plurality of movable transmitters (col. 2, lines 44-45) and a plurality of receivers (col. 2, line 44).

In regard to claims 69, 71, 86, and 93, Yokey further discloses receiving said transmitter signal with a second antenna array spaced from said first antenna array by a known distance, said second antenna array comprising a fourth antenna element that produces a fourth received signal, a fifth antenna element that produces a fifth received signal, and a sixth antenna element that produces a sixth received antenna signal; determining a third phase difference and a fourth phase difference between said fourth received signal, said fifth received signal, and said sixth received signal; and utilizing said third phase difference and said fourth phase difference to determine additional location information related to a second vector oriented in a second direction of said transmitter with respect to said second antenna array (either (1): Fig. 4, where the top and left sides can be considered a first array and the bottom and right sides can be considered a second array; or (2) col. 2, line 65 to col. 3, line 5).

In regard to claim 91, the features of this claim are covered with regard to claims 83 and 57.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 57, 61-62, 83, 86, 91, and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uematsu as applied to claims 56 and 58.

In regard to claim 57, it is well known to space antenna elements at one-half a wavelength, because at this spacing sidelobes do not form in the antenna pattern.

In regard to claims 61-62, the configuration described in claim 58 is essentially a planar array, and it is well known that a planar array provides a coverage over the 180 degree field of view from its radiating face.

In regard to claim 83, Uematsu does not explicitly disclose more than one receiver or more than one transmitter. Uematsu discloses the purpose of his invention is to control the attitude of antennas receiving satellite signals in a vehicle (col. 1, lines 721). He specifically refers to multiple vehicles (col. 1, line 14) and multiple satellites (col. 1, line 13). Satellites are movable (and in fact do move, even geostationary satellites, which move at the same rate as the planet rotates). It would have been obvious to one of ordinary skill in the art that in order to provide the system to multiple vehicles, a receiver would need to be provided to each vehicle, thus providing multiple receivers, one to each customer in a different vehicle. It would further be obvious that there is not just one communication satellite offering service in earth orbit, but a number of them, and that different customers might be subscribed to the services of different communications satellites. Thus, it would have been obvious to implement the system described in claim 56 with multiple receivers and multiple transmitters.

In regard to claim 86, it would have been obvious to one of ordinary skill in the art that multiple customers could use the same service, such that a first receiver and second receiver would react to the same transmitter.

In regard to claim 91, the rejection with regard to claim 57 addresses the antenna element spacing feature, and the rejection with regard to claim 83 addresses the multiple receivers and multiple transmitters. Uematsu discloses that the satellites are communication satellites (col. 1, lines 11, 45). Thus, the transmitters would be part of a transceiver that could also receive as part of communications, and the receiver would be part of a transceiver that could also transmit as part of communications. Uematsu further discloses the set of transceivers with the antenna array being affixed to vehicles (col. 1, lines 46-47).

In regard to claim 93, Uematsu further discloses each receiver determines a first and a second direction (col. 1, lines 52-53).

8. Claims 57, 61-62, 83, and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochiyama as applied to claim 56.

In regard to claim 57, it is well known to space antenna elements at one-half a wavelength, because at this spacing sidelobes do not form in the antenna pattern.

In regard to claims 61-62, the configuration described by Kochiyama is a linear array (Fig. 5), and it is well known that a linear array can provide a coverage up to 360 degree around the axis between the elements.

In regard to claim 83, Kochiyama does not explicitly disclose more than one receiver or more than one transmitter. Kochiyama discloses the purpose of his invention is to transmit solar energy (col. 1, lines 12-15) from multiple stations (col. 1, line 12, 16-17) to multiple locations (col. 1, lines 14-15, 17-18). Satellites are movable (and in fact do move, even geostationary satellites, which move at the same rate as the planet rotates). It would have been obvious to one of ordinary skill in the art that to provide the energy to various locations, a receiver would need to be present at each location, thus providing multiple receivers, one to each power receiving location. It would further be obvious that there is not just one power transmitting satellite, but a number of them, that receiver would be necessary that would receive from each of the satellites, or else the satellites would serve no purpose. Thus, it would have been obvious to implement the system described in claim 56 with multiple receivers and multiple transmitters.

In regard to claim 86, it would have been obvious to one of ordinary skill in the art that multiple locations could use the same power transmitting satellite, such that a first receiver and second receiver would react to the same transmitter.

9. Claims 76-79, 88-89, and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokev as applied to claim 75.

In regard to claim 76, it is well known for communication system base stations to separately time multiplex multiple transmitter paths because more than one transmitter may need location at the same time.

In regard to claims 77-79 and 95, Yokey further discloses indexing multipath components for said first received signal, said second received signal, and said third received signal with respect to timing of a locally generated PN sequence (col. 4, lines 25-34).

In regard to claims 88-89, Yokey further discloses the moving transmitter being a vehicle (col. 2, lines 33-38). It is well known to provide the determine location of a vehicle to the user on a map to aid in their navigation.

10. The examiner also finds the following reference(s) relevant:

Kennedy, which discloses three antennas where phase difference is used to determine location with elements at distances of $n\lambda/2$ from each other.

Moore, which discloses displaying the determined position of a vehicle on a map located at the vehicle.

Applicant is encouraged to consider these documents in formulating their response (if one is required) to this action, in order to expedite prosecution of this application.

Allowable Subject Matter

11. Claim(s) 66, 70, 80-85, 87, 90, 94, and 96 is/are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and if the double patenting rejection is overcome.

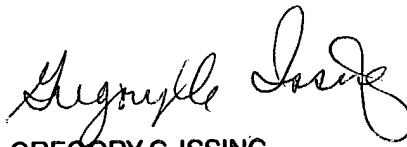
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred H. Mull whose telephone number is 703-305-1250. The examiner can normally be reached on M-F 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H. Tarcza can be reached on 703-360-4171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

fhm

Fred H. Mull
Examiner
Art Unit 3662



GREGORY C. ISSING
PRIMARY EXAMINER